Education Research and Educational Practice: The Qualities of a Close Relationship

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Abstract

The relationship between education practice and education theory has a long history. In modern times, education practice and its relation to education research has been central to debates about the nature and quality of education as an academic discipline in universities. This paper reports an empirical study that investigated a new instantiation of the practice-theory debates – 'close-to-practice' research in education. The research, a) sought to define and further articulate the concept of close-to-practice research, and b) provide reflections on the quality of close-to-practice research. The orientation of the work reported in the paper is informed by theory on traditions of knowledge in the organisation of education that have contributed to the development of education as an academic discipline.

The main section of the paper reports the findings of the empirical study. The research design was a rapid-evidence-assessment and a series of interviews with education researchers whose experiences were highly relevant to understanding of close-to-practice research issues. The conclusions of the research are reported in relation to how close-to-practice research might be defined, including in relation to quality, but also implications for education as a discipline in universities subject to nation-wide assessments of quality.

Debates about the links between practice, theory, knowledge and education can be traced back to Ancient Greece. In Plato's *Republic*, concepts of justice, truth and reason underpinned the practical suggestion that education should prepare the guardians of the ideal city through an education where music and gymnastics would be central. Plato and Aristotle articulated an important distinction between two kinds of knowledge: technical reason and practical reason. Plato described ***techn*ē** as the kind of craft knowledge required for the applied tasks of making things, such as carpentry or building (somewhat complicated by some overlap with the concept of *episteme*, another kind of 'knowledge'). But it was Aristotle who established an important distinction between technē and ***phronēsis*** (Dunne, 1997), the kind of knowledge required, for example, by professional people whose work includes praxis in public spaces, and hence knowledge that was more heterogeneous and contingent on interaction with other people than technē. As Greek society continued to develop there were further debates about the knowledge that should be central to education. For example, although Socrates had advocated the non-didactic teaching of fundamental values, the Sophists favoured value-neutral teaching of skills, (Preus, 1997). The ancient Greeks had established not only the importance of education, and of technical and practical reason, but also distinctions between practice and theory. The place of education in the history of human society is testament to its importance as an area of human thinking and development. However the formal

establishment of education as an academic discipline in universities was not to happen until the 20th century.

Theory depicting the origins of education in different countries has looked at the emergence of the academic discipline of education in relation to professional practice. Whitty and Furlong (2017) identified three main clusters representing origins of education in universities:

Cluster 1. Academic knowledge traditions - those traditions that foreground academic knowledge. Academic knowledge traditions include the idea of education built on the 'founding subjects' of philosophy, history, sociology and psychology.

Cluster 2. Practical knowledge traditions - based primarily in the world of practice: this includes the ideas behind competences and standards, and ideas that are part of networked professional knowledge;

Cluster 3. Integrated knowledge traditions - those traditions that explicitly attempt to bring academic and practical knowledge into some kind of relationship with each other: (*op. cit.*). Examples of Integrated knowledge traditions include "practitioner enquiry/action research" [sic].

An example given of the academic knowledge tradition is Germany, where education in universities was established earlier than many other parts of the world. It is suggested that "German educational theory has not been concerned with influencing the world of practice in a direct way; its concerns historically have been primarily philosophical and ultimately moral … with most researchers focusing on what Stokes (1997) would characterise as 'pure basic research.'" (Whitty and Furlong, 2017, p.??). Indeed "German educational theory" is one of the examples listed in the academic knowledge tradition. But German educational theory can also be linked with an 'integrated knowledge tradition', In Germany the important concepts of *Didaktik* and *Bildung* have been fundamental since the emergence of public schooling in the fifteenth century (Hillen, Sturm & Willberg, 2011). Hudson (2016) argued that *Didaktik* places the professionally autonomous teacher at the heart of the learning process and provides a frame for teachers to ask questions about their professional practice. However, the roots of Didaktik in Germany also lie in hermeneutics. Hence, Didaktik could perhaps be seen as related to *two* traditions of knowledge: "Academic knowledge traditions" deriving from Didaktik's roots in German hermeneutics but also "Practical knowledge traditions" reflecting autonomous teachers, in particular the ability to make decisions in relation to curriculum derived from their selections of knowledge embedded in their conceptions or beliefs about education. In the UK, education as an academic discipline has been described as being

> built on an enduring but unstable pragmatic compromise, a compromise between theory and practice, between knowing that and knowing how, in the commitment of the academy to make both an intellectual and a practical contribution to the advancement of the field. (Furlong, 2013, p. 5)

From the 1980s onwards two traditions in particular characterised the pragmatic compromise in education. *Practitioner enquiry* was typified by books such as [Dom to insert].

Action research however had a longer tradition, dating back in particular to a paper by Kurt Lewin in 1946. The main focus of Lewin's work was how groups interact, in particular the interactions of minority and majority groups, or "Intergroup Relations" the subject of the 1946 paper. In view of the many different interpretations of action research it is worth reminding ourselves of some of Lewin's ideas from the time. The key quotation where the phrase action research is first used by Lewin is this:

> The research needed for social practice can best be characterized as research for social management or social engineering. It is a type of action-research, a comparative research on the conditions and effects of various forms of social action, and research leading to social action. (Lewin, 1946, p.35)

Lewin made the point that action research need not be any less 'scientific' than "pure science in the field of social events." [Chris possible addition of some material about recent appraisals of the place of action research in education]

At the same time, for those engaging in action research, objectivity and generalizability are not the principal research attributes of value (Kock, 2005). Instead action research tends be valued most for its transformational potential, since it can enable those who wish to enhance their own circumstances to learn how to generate knowledge that is culturally relevant, and can be applied to improve their actions and so the impact these actions have on others (Wood *et al.,* 2019). As a result, action research has been described as both democratizing and political as it can be used to challenge both existing social norms and the structures that perpetuate inequalities (Cain and Harris, 2013; Whitehead, 2019; Wood *et al.,* 2019). Nonetheless, there is a risk that any democratizing impact of action research is potentially lost the more it is adapted and distorted to fit within traditional understandings of academic research and change processes (Whitehead, 2019). Despite this, the growth in the influence of Action Research, globally is evidenced in an increased number of publications and conferences dedicated to this area of Close to Practice Research. These include the Collaborative Action Research Network (CARN), Action Research Action Learning Association (ALARA), Action Research Network of the Americas (ARNA), and Network Educational Action Research Ireland (NEARI) as well as in Action Research Journals and International Handbooks of Action Research (Whitehead, 2019).

Cain, T. and Harris, R. (2013) Teachers' action research in a culture of performativity, *Educational Action Research*, 21, 3, pp. 343-358

Kock, N. (2015) Using Action Research to Study E-Collaboration, available at: https://www.researchgate.net/publication/242464512_Using_Action_Research_to_Study_E-Collaboration, accessed on 30 August 2019.

Wood, L. McAteer, M. and Whitehead, J. (2019) How are Action Researchers Contributing to Knowledge Democracy? A Global Perspective, *Educational Action Research*, 27:1, pp. 7-21.

Whitehead, Jack (2019) *The underlying importance of context and voice in action research.* In: Mertler, Craig A., (ed.) The Wiley handbook of action research in education. Wiley handbooks in education . Wiley Blackwell, Oxford, UK, pp. 207-228.

Some of the debates about education practice and education research in relation to education as an academic discipline in universities have also been part of education policy debates and initiatives. For example in countries such as Australia, Netherlands, Norway, Canada and the USA, education policy has focused strongly on promoting better links between research and practice (Coldwell *et al. ,*2017; Whitty and Wisby, 2017). In these kinds of policy developments the issues of close-to-practice are bound up with the idea of research/practice partnerships (Malik, 2016). For instance in Ontario the Knowledge Network for Applied Education Research (KNAER)[1] was established through a tri-partite agreement among the University of Toronto, Western University and the Ontario Ministry of Education. The aim of KNAER was to advance and apply robust evidence of effective practices through facilitating networks of educators and researchers to work collaboratively, to apply research to practice. Likewise, the Ontario Education Research Panel was established to facilitate discussion and collaboration among Ontario's school boards, faculties of education, and researchers, relating to opportunities for, and impediments to, the advancement of research and the potential for future partnerships (Malik, 2016). Similar are the notion of research-practice partnerships in the US. Here partnership approaches are viewed as 'long-term collaborations, which are organized to investigate problems of practice and generate solutions for improving district outcomes' (Coburn *et al.,* 2013: online).

This paper reports an empirical study that investigated a new instantiation of the practice-theory debates – 'close-to-practice' research in education, and its quality. The research, a) sought to define and further articulate the new concept of 'close-to-practice research', and b) provide reflections on the quality of close-to-practice research. The orientation of the work reported in the paper is informed by theory on traditions of knowledge in the organisation of education that have contributed to the development of education as an academic discipline.

[1] (http://www.edu.gov.on.ca/eng/research/knowledge.html)

The main section of the paper reports the empirical study of close-to-practice research that involved a rapid-evidence-assessment and a series of interviews with education researchers whose experiences were highly relevant to understanding of close-to-practice research issues. The conclusions of the research are reported in relation to how close-to-practice research might be defined, including in relation to quality, but also implications for education as a discipline in universities subject to nation-wide assessments of quality.

The next section of the paper introduces the origins of the term CtP, and also highlights another source of data about education as a discipline: the Research Excellence Framework. This section is followed by an account of the methodology of the empirical study. The findings from the rapid evidence assessment and from the interviews are presented. The paper concludes with a discussion about the significance of CtP to education as a discipline, and some implications for CtP education research and its quality.

The BERA Close-to-Practice (CtP) Research Project

The practices of education have been closely entwined with debates about the place of theory, research, and the nature of education as an academic discipline. A historically new variation of the theory-practice debate, and one that links with the status of education as a discipline, is the idea of 'close to practice' (CtP) research.

Close-to-practice research as a term can be traced to Cooke's (2005) exploration of Research Capacity Building (RCB) in relation to policy and practice in health services (and in particular how RCB could be measured more effectively). Cooke described the importance of practitioners building their research skills, with the aim of creating added value for research; a phenomenon that she described as "RCB close to practice" (Cooke, 2005, p.3). Hence, the notion of close-to-practice research is relatively well developed in the health sector where, like education, research informs professional practice. In the health sector, efforts to base research on problems in practice include: building practitioners' research skills (Cooke 2005); practitioners commissioning research, or co-producing it with researchers (Frankham, 2009); and enhancing the value of research for decision-making by setting priorities with practitioners and service users (Chalmers et al. 2014). These efforts focus on research that is 'close to the coal face'; whether it is small scale or large scale, conducted by individual teams or institutional partnerships, and conducted independently or supported by a national infrastructure (Cooke 2005).

More recently, and more specifically in relation to education research, the UK's Research Excellence Assessment (RAE) and now Research Excellence Framework (REF) has addressed the issue of practice-focused research. The REF plays an important role in measuring research quality in all universities and in all academic disciplines. One element within the REF is the scoring of research outputs on a scale from 1* to 4*, with 4* equating to research that

deemed to be world-leading in quality. In the REF 2014 exercise (the last to be held at the time of writing), although the proportion of research outputs in education judged to be world-leading broadly matched those of other social science 'units of assessment' (subjects or fields as defined within the REF), there were a significantly higher proportion of lower-graded outputs (that is, 2*, 1* and unclassified) in education than in others. Furthermore, of all units of assessment, education submitted the lowest proportion of higher education institution staff to the REF (as indicated by Higher Education Statistics Agency returns). The funding formula does not attribute Quality-Related (QR) funding to universities for work rated as less than 3*, although the value of such outputs is acknowledged in quality descriptors. The report from the education panel in the 2014 exercise drew attention to areas of relative strength and weakness in the field. On classroom enquiry, for example, the panel made the following observations.

> There were many examples of practice-focused research, the best of which drew on social scientific theory, method or both. Some of these were world-leading, particularly those featuring co-production or close collaboration between learners, teachers and researchers. Weaker outputs were often descriptive and were judged to be of modest originality, significance and rigour. Such research is a very important form of professional activity in the development of self-improving education systems but is, by its very nature, contextually variable. (HEFCE, 2015, p.109)

A more specific reference to close to practice in education in the REF education panel report noted that "Some studies, close to practice, lacked originality, significance and rigour" (underline added. Higher Education Funding Council, 2014, p. 195) and "Less strong research in the submission was often the small-scale professional research or action research which was frequently insufficiently theorised to make a contribution to knowledge and/or was low in rigour with poor use of statistical data or inappropriately selective reporting of qualitative data." (p. 107)

The importance of the issues in relation to practice, research, education and its scholars, in relation to education as an academic discipline was reflected in responses to the REF panel report. The spring 2015 issue of the BERA's *Research Intelligence* magazine carried articles on the 2014 REF which included comments about the quality of CtP research (Pollard, 2015). BERA's responses also had their origins in previous work, for example the BERA–RSA inquiry that reported in 2013 that addressed research and teacher education (see Tatto & Furlong, 2015, for an editorial introduction to the papers that emerged from this project).

As a result of the history of debates, including those that were present at BERA's inception and those that recurred periodically (e.g. see Tatto and Furlong, 2015; Pollard, 2015), but also in relation to the issues identified in the REF report, The *BERA Close to Practice (CtP) Research Project* was commissioned by BERA to address the overarching research question: How can high quality CtP research be characterised and enhanced for UK

education? The findings of the CtP project informed BERA's statement about CtP research and research quality [insert link here].

Methodology

To addressing the overarching research question two main elements were undertaken:

1. The first main element was a rapid evidence assessment (RAE) of published research papers that focussed on two areas:

    a. CtP methodology studies - research papers and systematic reviews of research across academic disciplines that focussed mainly on methodological aspects, of CtP research;
    b. CtP education studies – research papers reporting outcomes of education research that was close to practice.

The research team (the authors of this paper) assessed 1.a. and 1.b. in order to characterise the types of CtP research attracting academic attention in the UK. The ultimate goal was to select CtP studies in a systematic way and then subject them to assessment in relation to the originality, significance and rigour of the work reported in the papers.

2. The second main element was interviews with UK-based people with relevant knowledge and experience in relation to CtP research, in order to explore its value, complexities, qualities, and the potential for building capacity within the UK.

Phase 1: Rapid evidence assessment

The REA focussed on a term, CtP research, that was relatively new to the discipline of education, and that as a concept is very broad. As a result the REA had to break new ground at each stage of the process. Unlike more conventional systematic reviews that, for example, consider the evidence in relation to a tightly defined topic, such as the effectiveness of teaching methods in a specific subject area, the REA built its own definition for the concept that was an explicit focus of the investigation: CtP research. Furthermore, the research had to address methodology, and the study of methodology, as one of the ways to understand how CtP research was and might be defined, not only as a technical aspect of research quality, a use that is the norm in the ways that systematic reviews consider the research methods of the studies under their consideration. Consistent with emerging best-practice the REA was also informed by users of the research – specifically the BERA steering group, which encouraged the research team to follow some additional lines of enquiry as the process unfolded. These lines of enquiry added to the value of the work, but also added complexity to the REA process. The overall process of the REA is illustrated in diagrammatic form in Figure 2.

1a. Rapid evidence assessment of CtP methodology studies

The initial stage of the REA began with the identification of traditions/categories of CtP research using previously published reviews of relevant studies. A purposive search to link one seminal document/study per tradition, and systematic reviews relevant to each tradition, was undertaken. For those traditions in which there was no systematic review, key publications that included thorough reviews of relevant literature were considered.

The search of sources rich in systematic reviews identified 29 potentially relevant articles mentioning education from the Campbell Library, eight systematic reviews from the EPPI-Centre that were related to CtP research, and considerably more published by the Education Endowment Foundation (EEF). These reviews shared the following characteristics:

- they rated the quality of their included studies
- they were aligned with quality criteria for systematic reviews.

However, although the systematic reviews that we found referred to the quality of the research of the studies they reviewed, none of them, from any of the three sources, explicitly addressed the quality of that element 'closeness to practice'. Therefore, the systematic reviews were excluded from further review, as further analysis was unlikely to offer additional learning.

In this first stage of the review 16 different research traditions related to CtP research were identified (see findings in this paper), and within these traditions 40 potentially relevant papers were located. Of those 40 papers, 14 were excluded (see search strategy Appendix 1). The remaining 26 documents met the inclusion criteria. These were reviewed to determine, for each document, the purpose of the document; the origins of the approach taken; the core characteristics of the research; the definition of CtP research; the quality criteria; and the strengths and limitations of the methodology. EPPI-Reviewer software (Thomas, Brunton and Graziosi, 2010) was used to manage all review data and to facilitate analysis throughout all stages of the REA.

1b. Rapid evidence assessment of CtP education studies

A systematic search by keywords was conducted (see appendix 1). An electronic search of the British Education Index (BEI) initially identified 1,343 potentially relevant titles/abstracts. Subsets were identified electronically as: practitioner research (252); action research in education (204); design-based research (147); evidence-based research (135); evidence-based research AND education (123); developmental research (121); and knowledge transfer research (36).

For reasons of time it was necessary to focus in on one of the traditions for the more in-depth work that would ultimately include reading of full publications and assessing their research quality. Findings that emerged from

the interviewing process, and the ongoing work of the team with the steering group, revealed that *action research* was a particularly notable tradition related to how CtP research was perceived in general in the UK. Of the titles/abstracts within the action research in education studies subset, 155 had been published in peer-reviewed journals.

On the advice of the BERA steering group an additional search was carried out, within a selection of sources that it was anticipated would be rich in school-subject-focussed studies, which it was felt may not have been captured sufficiently by the more general search strategies. These were academic journals that were thought likely to specialise in one or more types of CtP research, and to include school-subject-focussed research among their articles. 115 sources were identified through this additional search. The journals searched were: *Educational Researcher*, *Reflective Practitioner*, *Literacy*, *Education 3-13, English in Education, Research Papers in Education*, and *Research in Mathematics Education.*

The output of the searches was inspected for CtP studies, categorised as classroom or subject practices, teaching or assessment practices, or teacher training. This selection resulted in 47 potentially relevant action research studies. These 47 studies were examined for two different purposes: a) to analyse CtP studies from any context (28 studies); b) to examine close-to-practice studies based in the UK (17 studies). Of those 17 papers, five were ultimately excluded by the research team because they did not report implementation of CtP research as an empirical research project.

This part of the REA resulted in the selection of 12 UK-oriented studies that were subject to full text review. Information was extracted from the 12 articles based on four questions proposed by the steering group:

- What kinds of practices have been investigated in CtP research?
- What questions about these practices have been investigated?
- What kinds of claims have been advanced, and outcomes achieved?
- What theoretical tools have been drawn upon?

The final part of the REA involved assessing the quality of research in a selection of articles that fitted the definition of CtP research established in phase 1a of the REA. In order to select examples of articles, the research team returned to the 47 potentially relevant titles and abstracts of action research. From these 47 articles, 19 were excluded. The reading of full texts, rather than abstracts alone, revealed that some studies were not in the end sufficiently aligned with our definition of CtP research. The remaining 28 articles were allocated to members of the research team to be reviewed for originality, significance and rigour, and to give an overall judgement of ‘low’, ‘medium’ or ‘high’ research quality.

Phase 2: Interviewing experts in CtP research

In consultation with the BERA steering group for this project, three types of interviewee were agreed to be important.

1. People who work and write in a CtP research tradition, and would have something to say on its value and complexities.
2. People who might have insights into the structural difficulties in the field that impact on capacity building.
3. People whose roles give them insight into the quality of CtP research.

These roles were used as the basis for recruiting the interviewees described in table 1.

The interview consisted of six questions that sought the opinion and thoughts of interviewees about the following dimensions of CtP research:

- definition of CtP research
- identification of traditions of CtP research
- factors that could determine and enhance quality criteria for CtP research
- comparison between experiences in different nations of the UK
- the role of CtP research in different phases of education and educational settings
- ways in which BERA could support the development of CtP research.

A total of seven semi-structured interviews, one with each interviewee, were conducted between March and April 2018. All interviewees gave informed consent, and received the schedule of the interview in advance (and the research project as a whole was subject to the university ethics application process). Interviews were undertaken using Skype or phone, or in-person. Digital recordings were transcribed in full by a professional transcriber. The duration of the interviews ranged between 13 and 56 minutes, with an average duration of 40 minutes.

Analysis was conducted using QSR International's NVivo 10 qualitative data analysis software. A thematic approach to coding was adopted. Coding focussed on identifying the main and most recurrent themes in the different dimensions proposed in the interview schedule, as well as identifying other topics that were considered relevant and of interest in relation to the research questions. Interview data was coded using NVivo 'nodes'. Each node reflected answers from different respondents to a particular theme. Likewise, node hierarchies were created in order to illustrate the relationships between topics and to differentiate between general themes (parent nodes) and more specific sub-themes (child nodes). These nodes and hierarchies are shown in figure 1, , and table 2 provides a brief description for each node.

Findings

REA of CtP methodology studies (phase 1a)

Sixteen different traditions of CtP research were identified: action research, co-creation research, design-based research, evidence-informed practice,

knowledge mobilisation, knowledge transfer/exchange, lesson study, practitioner research, research-informed teaching practice, research learning communities, school improvement/school effectiveness, transdisciplinary research, implementation science/improvement science, insider research, citizen science, and service learning. As can be seen in table 3 seven articles were categorised as ‘evidence-informed policy and practice’, six as ‘design-based research’, six as ‘knowledge mobilisation/exchange/transfer/K*’, and five as ‘action research’ (the same research document could be included in more than one category). Those studies categorised as ‘evidence-informed policy and practice’ did not refer to specific methodological approaches; instead, emphasis was placed in general on the relevance of conducting practices and developing policies based on evidence from research.

On reviewing the selected articles the research team differentiated between those methodological approaches that were well-established, and the more incipient approaches. Action research was the most well-established approach, with origins dating back to mid-20th century. By contrast, examples of CtP research areas that have recently emerged include research learning communities and knowledge mobilisation.

The following key characteristics were shared across nearly all CtP methodology studies that were reviewed:

- an emphasis on the cyclic and dynamic iterative process of research and its application;
- an emphasis on the relevance of practitioners reflecting on their practices;
- the work involved close collaboration and/or a strong relationship between academics and practitioners;
- the work was focussed on solving specific problems identified by practitioners, or communities identified by practitioners, or other users of research;
- the work sought to make an impact on practice, and sometimes to make a contribution to the theory and methodology;
- points were made about the need for an effective and supportive learning environment in order to engage in research and build capacity in research use.

Some common difficulties and challenges were also identified.

- In contrast with the normal activities of a professional (teachers’ work, for example), doing research detracted from the time that is available for what was perceived to be core work;
- financial resources were required to create partnerships between practitioners and researchers;
- time was required for practitioners to acquire expertise in research methods, and for researchers to understand the contexts of practice;
- it was challenging to transfer research skills and knowledge from the trained practitioners to the rest of the actors involved in the

organisation. As a result, CtP interventions relied on particular individuals to support the development of knowledge and skills.

None of the CtP methodology studies that were located as part of the search specifically addressed the research of academics with responsibilities for initial teacher education (ITE).

REA of CtP education studies (phase 1b)

The initial results of the BEI search of the CtP education studies (1,343 titles and abstracts) were ultimately reduced to 12 CtP research studies originating in the UK (consistent with the aims of the research commission). Table 4 presents a summary of the levels within the education system, and the subjects/disciplines, that were addressed in each of the 12 studies. No study focussed on early years education. Six of the studies focussed on school subjects such as maths, English or science, while the other six focussed on wider issues.

The most common types of focuses in the UK CtP studies (using action research methodology) were those concerned with school teacher development in order to produce knowledge about the nature of teaching and learning processes, and/or to develop effective teaching strategies that could help students' learning (see table 5). For instance, Cain, Holmes, Larrett and Mattock (2007) focussed on how action research could help trainee teachers to reflect about different dimensions of their practice such as behaviour management, monitoring and assessing, and pupil-centred education. Gibbs et al (2017) looked at the ways in which action research had been used in higher education both to improve diverse aspects of teaching practice and to promote students' engagement.

Judging the quality of CtP research

The final stage of the REA was a review of the research quality of 28 studies. Table 6 shows the frequencies of quality categories that were applied by members of the research team to these studies.

The six studies categorised by the research team as high-quality all featured practitioner-focussed CtP problems. Effective, appropriate and explicit use was made of the research design, for example multiple cycles of action and research. Other necessary design elements included clear theoretical framing. These studies made an original contribution to an aspect of practice, and demonstrated robust use of methodology. Other characteristics of these studies were that the original contribution of the study was made explicit, and sufficient theorisation was evident in the research.

Eleven studies were categorised as 'medium quality' CtP research. In general, these articles provided more detail about their analyses and methodologies than low-quality studies. However, small sample sizes were not sufficiently compensated for by greater theorisation. Accounts of methods of data

analysis were not comprehensive enough. Analysis was often of insufficient depth, findings were often too descriptive, and hence overall the studies lacked explanatory power.

Eleven studies were categorised as 'low quality' CtP research. In most cases, articles were found to be low-quality because of a combination of most the following factors:

- findings that were too descriptive
- research that was under-theorised
- small-scale of the study not offset by depth of analysis and/or theorisation
- lack of detail in the description of the methodology and methods of the study.

Findings, phase 2: Perceptions of CtP research in the UK

Some features of the high-quality CtP outputs identified in the REA were also reflected in some of the positive observations by the interviewees about CtP research. However, the interviewees recognised significant challenges facing those who undertake CtP research. The weight of comments about the challenges of CtP research reflected the aim of the interview phase, which was to explore such challenges.

The relevance of CtP research in education

CtP research was perceived by interviewees as an important type of research in education mainly because of its impact and applicability, and the opportunities it offers to connect theory and practice in order to develop richer understandings of educational issues in practice, but also at a policy level.

Kim: *'... and I think that it is about that really strong reporting of the contextual issues that are prevailing within that close-to-practice arena, because that's the bit I think that brings the richness that those researchers that are not working in the close practice field miss.'*

High-quality CtP research was seen by the interviewees as research that focussed on issues that are important for practitioners, providing them with tools to better understand their problems, and to find solutions to improve their practice and promote meaningful change. It was argued that CtP researchers recognise 'usefulness' and 'practicality', but in the best cases also know how theory can be applied in a particular context in order to help broaden understanding about practice (theory in the every-day sense, or perhaps in the sense intended by Aristotle in relation to professionals in a public space). Although interviewees argued that the practice–policy relationship is complex, they pointed out that policy, research and practice are often concerned with the same problems, and CtP research is a relevant way to connect and contextualise theory and policy. It was reported that CtP research can

contribute to the articulation of ‘that space in relation to policy research and practice’ (Kim).

While reflecting on the definition of CtP research that emerged during the course of the project, most interviewees pointed out that there was a distinction between what is considered ‘academic research’ and research conducted within school settings by practitioners. Four respondents conceptualised the latter as ‘practitioner enquiry’. According to the interviewees one of the main elements that differentiates academic research and practitioner enquiry is the role of academic theory, which can enable generalisation across cases. It was acknowledged that the main purpose of academic research is a contribution to knowledge, while practitioner enquiry is linked to more practical aims, which are specific to particular education contexts.

Some respondents noted that the use of a strong theoretical framework to support and enable the generalisation of findings is a fundamental feature of rigorous research. Related to the role of theory was the view that a robust methodological framework that supports confidence in research findings, and therefore allows more acceptance of the generalisation of the research findings, was necessary.

Some of the interviewees saw academic research and practitioner enquiry as two ends of a continuum: on one side, practitioner enquiry which is more concerned with practical and contingent issues, and therefore usually based on small samples sizes or short-term interventions, or both. At the other end of the continuum is academic research, which seeks to contribute to knowledge.

Aida: *‘But if it is going to be called research then ... the primary objective is to improve knowledge which may then be applied to the improvement of practice and policy, but its primary aim is knowledge itself ... For enquiry I think the primary aim is a more direct improvement [of practice].’*

Mike: *‘I’m not sure that practitioners are particularly interested in originality and significance... certainly in the way that we would define them – they’re more concerned about... How can this help my practice? How can this help us to make this a better school? How can we get better outcomes for the children?’*

However, the simple idea of a continuum from academic research to practitioner enquiry was complicated by perceptions that strong CtP research included features of academic research, such as robust theory and methodology. When these are present, more comprehensive and complex understanding of practical outcomes, *and* a contribution to knowledge, was deemed to be possible.

Kim pointed out that the distinction between academic research and practitioner research involved an ‘identity shift’. From the practitioners’ side it was necessary to ‘learn a completely different language’ in terms of theory

and methodology. We would add, for the researchers it requires sufficient understanding of how the context of practice might challenge the researcher's world-view.

Conceptualisation of knowledge and what counts as research

Some critical views arose in the course of the interviews regarding the role of the REF in establishing criteria for quality. All interviewees regarded the REF as the main driver for development of research within universities in the UK, particularly as the next REF review deadline was due in 2021. Not only was it felt that REF criteria were increasingly defining what 'good' research is, but interviewees also suggested that the REF was having an impact on choice of research topics, research methodologies and types of research publications that were regarded as desirable. An argument was made by some interviewees that the REF was narrowing what counts as research, and also entrenching the division between practitioner research and academic research. Furthermore, some interviewees felt that in this division there was a deficit model of CtP research, which it was predicted would typically attract lower star ratings in REF scoring.

There was recognition that each research output is assessed by the REF reviewers according to its merits in relation to a specific field of enquiry, but never-the-less that the association between 1* REF outputs and practitioner research was felt to be present. However, some interviewees appeared to have a misconception about 'what counts' in the REF – for example, that high-scoring REF outputs are only published in 'certain kind[s] of journals' with particular impact factors. The REF education panel reviewers are required to judge outputs on their merits in relation to the criteria of originality, significance and rigour, not in relation to general metrics such as journal impact factors and status, however it is possible that these such metrics may have some influence on reviewers' judgements.

An interesting point made by Mike was about the change over time, possibly influenced by REF, to how school-based research is conceptualised within universities. He mentioned that the work he was conducting as an academic in collaboration with a school was being defined by his university as 'consultancy', not as research. He highlighted how the role of academics in practitioners' research had changed, so that what was once considered school-based research was today conceptualised as consultancy.

Other interviewees added a critical view about the distinction between researcher and practitioner activities, arguing for a more collaborative and horizontal partnership in which both partners contribute relevant knowledge.

Val: *'I'm particularly interested in how knowledge is created and translated within different communities, and my view is that actually they're both practice communities ... So the idea that one is and one isn't [research] is misleading, … they're different practices which intersect.'*

Related to the distinction between academic research and practitioner enquiry, most interviewees acknowledged that CtP research is usually undermined through comparison with other research.

Aida: *'But you know unfortunately I think the word 'research' has a certain kudos around it, which possibly 'enquiry' lacks ... and of course nobody wants to be told that they're not doing research, that they're 'only' doing enquiry, if you put it you know in a pejorative way like that.'*

Quality criteria in CtP research

One issue that was widely agreed upon was that the size of the sample, and the scale of the research, were important considerations in relation to the quality of research. The respondents signalled that the small size and scale of CtP research had been identified as an issue for the quality of this type of research. However, most agreed that sample and scale were not *necessarily* an obstacle to producing relevant and high-quality research, because the ability to link theory and practice could enhance the quality of research sufficiently to compensate for or address concerns about a small sample size and/or scale. Most interviewees agreed that CtP research was perceived typically as small scale, with small sample sizes, and as consisting of analysis that was usually not explicitly related to or supported by theoretical frameworks. This was linked to a perception that CtP research was more focused on seeking to provide a response to a practical problem. The interviewees recognised that practitioners have a rich knowledge of the contextual issues and cultural aspects of research sites. However, they may not know how to interpret the data using a robust theoretical framework, and the consequent research reports and papers can be descriptive and under-theorised.

Another feature related to quality criteria was the methodological rigour of the research. One of the difficulties that experienced academics mentioned was that practitioners struggled to identify the problem in research terms, and therefore the purpose and questions that would guide the research. Interviewees recognised that practitioners are often not familiarised with the variety of research tools available, and therefore have difficulties in selecting the most appropriate tools according to the purpose of the research. Relating research tools to theory was also seen as a challenge.

Val: *'There's no reason why close-to-practice research can't be rigorous in its methodology, there is no reason that you can't analyse that data, you know, with a rigour of a theoretical underpinning and a good theoretical framework for analysis. So it's almost again the lack of understanding of how you bring the theory and practice together.'*

With regard to methodology, a positivist quantitative approach was mentioned several times as a referent, but it was also recognised that this was not the only way to do relevant and high-quality research. Different interviewees argued that researchers must choose a theoretical and methodological

approach that is relevant for the research purposes and questions, and they should report the reasons why they have chosen this approach, as well as its contribution to the research process and outcomes. Being transparent about methodology, it was felt, adds to the quality of the research.

Val: *'And... I always think that the qualitative equivalent to statistical analysis is transparency and replicability. You know you've got to be completely transparent about what you did, why you did it, how you did it, so that someone else can see – they can't run it through SPSS, but what they can do is say, "Right well I don't think that was a very good decision", or "Because you decided that, that happened".'*

Other relevant aspects concerned conducting a robust literature review to support the arguments presented in a publication, as well as in providing a detailed contextualisation of the practice being studied. Some interviewees mentioned the importance of being rigorous in defining the terms of the 'approaches'. One of the problems in CtP research is blurred boundaries between and lack of definition of what each of the approaches implies in theoretical and methodological terms – something that can undermine the quality of CtP research. For instance, Val pointed out that different terms are used in CtP research in education that describe essentially the same method, and that similarly different terminologies are 'nest[ed] within each other'.

Discussion and Conclusions

As a result of conducting the REA and the qualitative interviews, and further thinking as a result of the dissemination and engagement activities we concluded that CtP research could usefully be defined as follows:

> *Close-to-practice research focuses on issues defined by practitioners as relevant to their practice, and involves collaboration between people whose main expertise is in research, in educational practice, or both.*

The research also enabled us to propose a definition of *high quality* in CtP.

> *High quality in CtP research requires the robust use of research design, theory and methods to address clearly defined research questions, through an iterative process of research and application that includes reflections on practice, research, and context.*

High-quality CtP research has the intrinsic benefits, as some see it, of being close to practice: the applicability to 'problems' in practice; the frequent connections between practice and policy that CtP research is very well placed to explore; and, crucially, the potential for rigorously linking theory with practice – a link that, as we discuss below, is insufficiently established in some CtP research.

One overarching theme that linked the REA with the interviews arose through testing the definition of CtP research that had been established in the REA phase. Interviewees tended to regard CtP research as research undertaken

by practitioners in schools and other education settings. It was less common for interviewees to refer explicitly to research undertaken by practitioners employed in universities, for example those whose main work was in teacher training. This perhaps reflected considerable uncertainty about the nature of practice and of research in relation to teacher-training roles. Those whose work involves teacher-training are frequently closer to practice than other academics, in many cases, literally as a result of recently moving from school employment to university employment, but quickly come under pressure to adopt the conventions of research such as those emerging as a result of the REF.

With regard to academic disciplines, the most important aspect of any research is the extent to which it makes an original contribution to knowledge. There were examples of high-quality CtP research that both made a significant original contribution and also, crucially, explicitly identify the original contribution to knowledge that they offered. One important factor in a study's originality is the extent and rigour of the review of relevant studies in the field presented in its literature review. Weaker CtP research fails to survey previous research in sufficient depth, so is unable to provide sufficient warrant of an original contribution.

The best CtP research gives a full and rigorous account of whichever methodology has been selected. Fundamental aspects of chosen research designs are in place: for example, the strong presence of theory *and* empirical data (qualitative and/or quantitative). In weaker CtP research, methodology is not explained in sufficient depth. One methodological aspect that is frequently neglected is a sufficiently rigorous account of data analysis processes, particularly where research is qualitative. There is a need for a more explicit focus on methodology in much CtP research. In addition to enhancing the quality of CtP reserach papers, a more explicit focus on methodology is necessary to ensure that CtP research outcomes have relevance beyond the local if the work is to get the recognition that processes such as REF endow. This movement from more local relevance to national and international relevance will be achieved through greater understanding of quality in both empirical studies and in studies with conceptual or theoretical emphases. Wider relevance is necessary to make the outcomes of CtP research more likely to be judged by academic peer-reviewers as high quality.

The ultimate consideration for research is its significance and impact. The previous points made about originality and rigour are also relevant to research significance. If research is not of sufficient quality in general, it is not going to be deemed rigorous or significant, and therefore is unlikely to have positive impacts. Although the scale of research is very much a methodological aspect, it also has a clear influence on the likelihood of the research being significant in and to its field. The strongest CtP research offered sufficient depth in its analysis and findings despite what some might regard as small sample sizes. The rigour of the theorisation was an important element of this depth of analysis. Much less common was CtP research with larger sample sizes, including quantitative analyses based on statistical probability. In the context of more general weaknesses in quantitative research in social

sciences, education as a discipline needs to continue to attend to this, including supporting greater use of quantitative methods in CtP research.

In addition to their intrinsic relevance, the critieria of originality, significance and rigour are used in the assessment of research outputs in the UK's Research Excellence Framework (REF). Some of our interviewees raised significant concerns about the ways in which the REF was being addressed in university settings: it was reported that the REF is negatively influencing perceptions of research that is close to practice. Part of this argument was recognition that practitioners' understandings of the purposes of research often differed from researchers' perspectives. A key distinction was between the main research purpose of making a contribution to knowledge, and the main research purpose of making a contribution to addressing a practical problem. What's more, it was recognised that CtP research can have high value – to practitioners, for example – but may not make a contribution to knowledge in an academic field. Our research leads us to the view that contribution to practice and contribution to theory are not incompatible. However, in the context of the REF – which is a significant driver for university research, and hence has a direct impact on academic staff who see their research as close-to-practice – it is important that the distinctions of research quality, and the implications of engaging with these, are understood so that appropriate strategic decisions can be made by researchers when they consider the research projects they wish to engage with.

The evidence from this project provides empirical evidence to support the theory that education as a discipline still reflects a compromise between theory and practice resulting in a lack of coherence compared to educational enquiry understood in other parts of the world as a social science focusing on theory and basic research. In the REA there was continuing evidence of disjuncture between education as a social science versus education as CtP research. The participants in the research highlighted the tensions that have emerged as a result of education increasingly being categorised as a 'social science', including the influence of REF criteria. This is not simply a continuation of the coherence problem, it is perhaps a distinct shift engendered by stronger supra-national control of research quality, in line with other socio-political moves to control the work of professionals.

The limitations of this research included the relatively short timescale for completion of both a review of literature that was systematic, the REA, and qualitative interviews. It was necessary to limit the initial multidisciplinary search of the literature early on, and it was necessary to select one of the traditions of CtP research, action research, in order to reach the end point of the REA which was the full peer-review of research quality of the final section of texts. Analysis of some of the other dominant traditions of CtP research may have resulted in different conclusions although our experience more generally suggested that this was no likely to be the case. However some of the more nascent approaches may well yield additional findings. The small number of qualitative interviews was a limitation in relation to confirmatory findings but the purposive selection of people with particular expertise, and

long careers in education, resulted in significant observations of the state of educational research.

Possible future research could include further comparison with other academic disciplines and the links with associated professional practice. By using the definitions of CtP and of quality in CtP it would be interesting to see the extent to which the issues are replicated in other domains of social science but also other disciplines such as arts or natural sciences. It would be important to take account of the very different histories of different disciplines if undertaking comparison of this kind. Given that in the end the outcomes of research result in written language there is also the possibility to compare the ways in which publication processes, including peer-review, shed light on the relationships between practice and research, and hence the ways in which disciplines evaluate research outputs.

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Appendix 1 – Search Strategy

1. Systematic review sources (scanned all titles)
Campbell Library: search date 24/10/17 (since inception)
EPPI-Centre: search date 25/10/17 (since 2007)
Education Endowment Foundation: search date 25/10/17 (since inception)

2. Electronic databases Web of Science (WoS) Core Collection (search date, 11/11/17)

3. British Education Index (search date 14/11/17)

4. Journals for subject based searches: *Educational Researcher*
Reflective Practitioner
Literacy
Education 3-13
English in Education
Research Papers in Education
Research in Mathematics Education.

Electronic searches applied key terms to titles and abstracts published in English between 2007 and 2017. Typical search terms were:

Action Research AND Education
Action Research in Education
Action Research
Applied Research in Education
Design Based Research AND Education
Design Based Research in Education
Design-Based Research
Developmental research
Developmental Research in Education
Evidence based research
Evidence based research AND education
Evidence Based Research in Education
Knowledge transfer research
Participatory Action Research
Practitioner Research
42

5. Coding

Studies were included if they met at least one criterion in each of the following sets regarding the purpose, content and study design.

Purpose:
investigations by/with practitioners
investigations of the research-practice interface

investigations of structures (and underpinning standards) supporting close-to-practice research

Study design:
analysis addressing research quality by drawing on a body of literature (e.g. systematic review, critical review)
conceptual documents: these could be journal articles, book chapters or reports that provide theoretical overviews of the research areas
empirical studies in education that addressed classroom or subject practices, teaching or assessment practices, or teacher training, and/ or explicitly referred to a particular close-to-practice tradition (without necessarily commenting on the strengths and/or limitations of that research tradition)

For seminal papers and systematic reviews:

the study provides a definition/description of the research tradition (not just a mention of the approach used) AND
the study indicates the knowledge areas and contexts in which it was conducted AND
the study identifies strengths and/or limitations of the research tradition.

Furthermore, exclusion criteria were defined in terms of particular content and research traditions. Studies were excluded if they:

Investigated service learning (because such studies are designed for local learning with limited reach)
investigated citizen science (because the core aim of such research is to accumulate knowledge about science, not about improving educational practice).

The articles were entered into the EPPI software and coded as follows:

Authors
Area of knowledge Education
Health
Other

Domain of close-to-practice research

Investigating research–practice interface
Investigating by/with practitioners
Addressing support for close-to-practice research

Type of close-to-practice research
Action research/participatory action research
Capacity building initiatives (e.g. TLRP)
Close-to-practice support networks
Controlled trial
Design-based research

Implementation science
Improvement science
Insider research
Knowledge exchange/transfer/mobilisation/K*
Lesson study
Practitioner research
Research engaged schools
Research schools
Research informed teaching practice
Research learning communities
Research use
Evidence-informed policy and practice
School improvement
School effectiveness
Systematic review
Transdisciplinary research
What works centres (e.g. EEF)

Subject of teaching

Maths
Science
English
Humanities

Findings Purpose of article

Origins of approach
Core characteristics
Definition of close-to-practice research
Quality criteria
Strengths
Limitations

Level of education

Subject/discipline

Close-to-practice tradition

Focus of the investigation

Close-to-practice quality
High
Medium
Low

Figures and Tables

Table 1 Interviewees and their expertise

Type 1. People who work and write in a CtP research tradition and would have something to say on its value and complexities	**Pseudonym**
Strong subject background related to secondary school teaching. Research-active. Still active in teacher training.	Alan
Strong primary education science background through teacher training. Has become research-active over a long period of time. Still active in teacher training.	Peter
Type 2. People who might have insights into the structural difficulties in the field that impact on capacity building	
Programme leader of a PGCE. Pursuing a doctorate. Insight into planning of research time for PGCE colleagues.	John
Senior researcher with research interests, and senior management expertise, in educational policy and practitioners' work. Knows Scotland's education systems very well.	Kim
Researches close-to-practice issues through professional learning.	Val
Type 3. People whose roles give them insight into the quality of CtP research	
Significant involvement in REF.	Aidan
Editor of key practice-oriented peer-reviewed education journal. Involvement in professional organisation of relevance to CtP research.	Mike

Table 2. Definitions of NVivo nodes derived from analysis of the interview data

NVivo Nodes	Definition
Definition of Close-to-Practice Research	**This node categorizes how interviewees understand Close-to-Practice research**
Relevance of Close-to-Practice research	Summarizes the positive and relevant elements of Close-to-Practice research in education
Research vs Enquiry	Refers to the distinction made by the interviewees between academic research and practitioner research
Contribution to knowledge	Main element that distinguishes research types
Applicability of research findings	The appliication of research findings to practice
Theoretical and methodological framework	Robustness of theoretical and methodological framework in research activity
Undermined research practice	general view of practitioners' research as a research practice
Quality criteria in Close-to-Practice research	**Views of interviewees about the relevant criteria to identify quality of Close-to-Practice research**
Rigorous and explicit methodology and theoretical framework	Importance of authors following rigorous methodology and theoretical framework and provide an explicit account of these in reports/papers
Reflexivity and thorough analysis	Importance of inclusion of reflexivity about the research process and findings and developed thorough analysis
According to type of research	Quality of research to be assessed according to particularities and aims of Close-to-Practice research
Sample size and scale of research	Sample size and scale of Close-to-Practice research as features of this type of research, and their impact on quality of Close-to-Practice research
BERA's support to Close-to-Practice	**Interviewees' opinions about the ways in which BERA could support Close-to-Practice research in Education**
Development and support of practitioner's research skill	Relevance of enhancing practitioners' research skills
Alternative platforms to disseminate Close-to-Practice research	The need to look for varied ways - different to academic journal publications - to circulate Close-to-Practice research
Expand and validate knowledge of Close-to-Practice in the field	The need for BERA to take an active role in stressing the relevance of Close-to-Practice in education.

Funding of Close-to-Practice research	Interviewees' opinions about the need of providing multiple and varied opportunities for funding Close-to-Practice research in education

Table 3 Type of CtP research and area of knowledge of documents that met the inclusion criteria in phase 1a*

Area of knowledge			
Type of research	Education	Health	Other
Action research/ participatory action research	3	2	0
Capacity building initiatives (e.g. TLRP)	1	1	0
Design-based research	5	1	0
Knowledge exchange/ transfer/mobilisation/K*	2	3	1
Lesson study	3	0	0
Practitioner research	0	1	2
Research-informed teaching practice	2	0	0
Research learning communities	1	0	0
Research use	0	0	1
Evidence-informed policy and practice	5	2	0
Participatory research /community-based participatory research	0	1	0

Table 4: Level of education and subject focus of close-to-practice studies in the UK

Study	Level of education	Subject/discipline

Biza, Jaworski & Hemmi (2014)	Higher education	Maths
Boon (2016)	Primary education	English
Brindley & Bowker (2013)	Higher education	Ethics in school-based action research
Cain, Holmes, Larrett & Mattock (2007)	Higher education	Teaching training practices
Coates (2009)	Primary education	Science
Gibbs et al (2017)	Higher education	Higher education pedagogy and students' engagement
Grace, Rietdijk, Garrett & Griffiths (2015)	Secondary education	Science
Jaworski (1998)	Secondary education	Maths
Lofthouse, Flanagan & Wigley (2016)	Higher education	English
McDonnell and Curtis (2014)	Higher education	Assessment and feedback in higher education
Pearce (2014)	Higher education	Entrepreneurship in higher education
Wyse and Spendlove (2007)	Primary and secondary education	Creativity and creative learning

Table 5 Types of practices investigated in UK CtP studies

Study	Type of practice investigated	Research focus/objective/ questions
Biza, Jaworski & Hemmi (2014)	University mathematics education as social activity	To gain more insight into the nature of teaching and learning
Boon (2016)	Peer assessment in formative assessment	How to increase children's uptake of feedback during peer assessment in primary school writing
Brindley & Bowker (2013)	Ethics in school-based action research in the UK	Explore policy within schools regarding school-based action research ethic
Cain, Holmes, Larrett & Mattock (2007)	The ways in which action research assignments have been carried out by trainees in their practice in relation to (a) behaviour management, (b) monitoring and assessing, and (c) pupil-centred education	The efficacy of action research in encouraging self-reflection on teaching practices
Coates (2009)	Science teaching	Development of strategies that would enhance science teaching for gifted children
Gibbs et al (2017)	Teaching practice in higher education and student engagement	How action research has been used in higher education
Grace, Rietdijk, Garrett & Griffiths (2015)	Physics teaching	Explore the impact of the Action Research for Physics programme
Jaworski (1998)	Teachers researching their own mathematics teaching at secondary level	How do teachers formulate their research? What is the nature of the evolution of the teachers' research? What is the role of the project in motivating and sustaining teachers' research? In what ways does the research influence mathematics teaching: how is the nature of the subject (that is, mathematics) significant to this research?
Lofthouse, Flanagan & Wigley (2016)	Development of CPD program to meet needs of diverse communities	Develop a video coaching approach to teach English in multicultural settings
McDonnell and Curtis (2014)	Development of democratic feedback model with higher education students	Explore the potential for more democratic practice in assessment and feedback

Pearce (2014)	Higher education	Entrepreneurship in higher education
Wyse and Spendlove (2007)	Creative partnerships in education	Explore the outcomes of an action research approach to creative learning in the context of creative partnerships

Table 6 Close-to-practice quality of 28 reviewed articles

Close-to-practice quality	Number of articles
Low	11
Medium	11
High	6
Total	**28**

Figure 1: Themes/NVivo nodes derived from the interview data

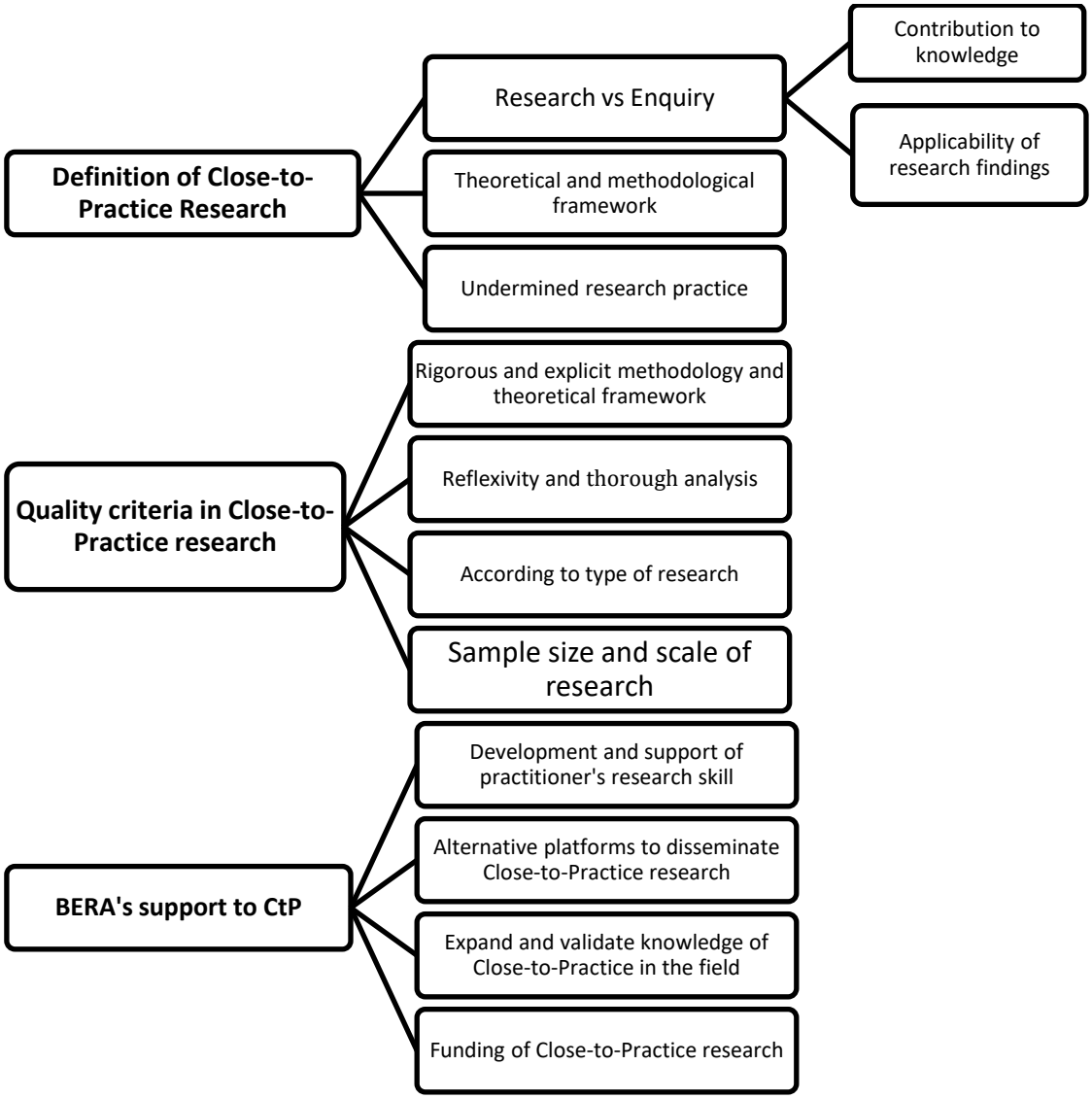
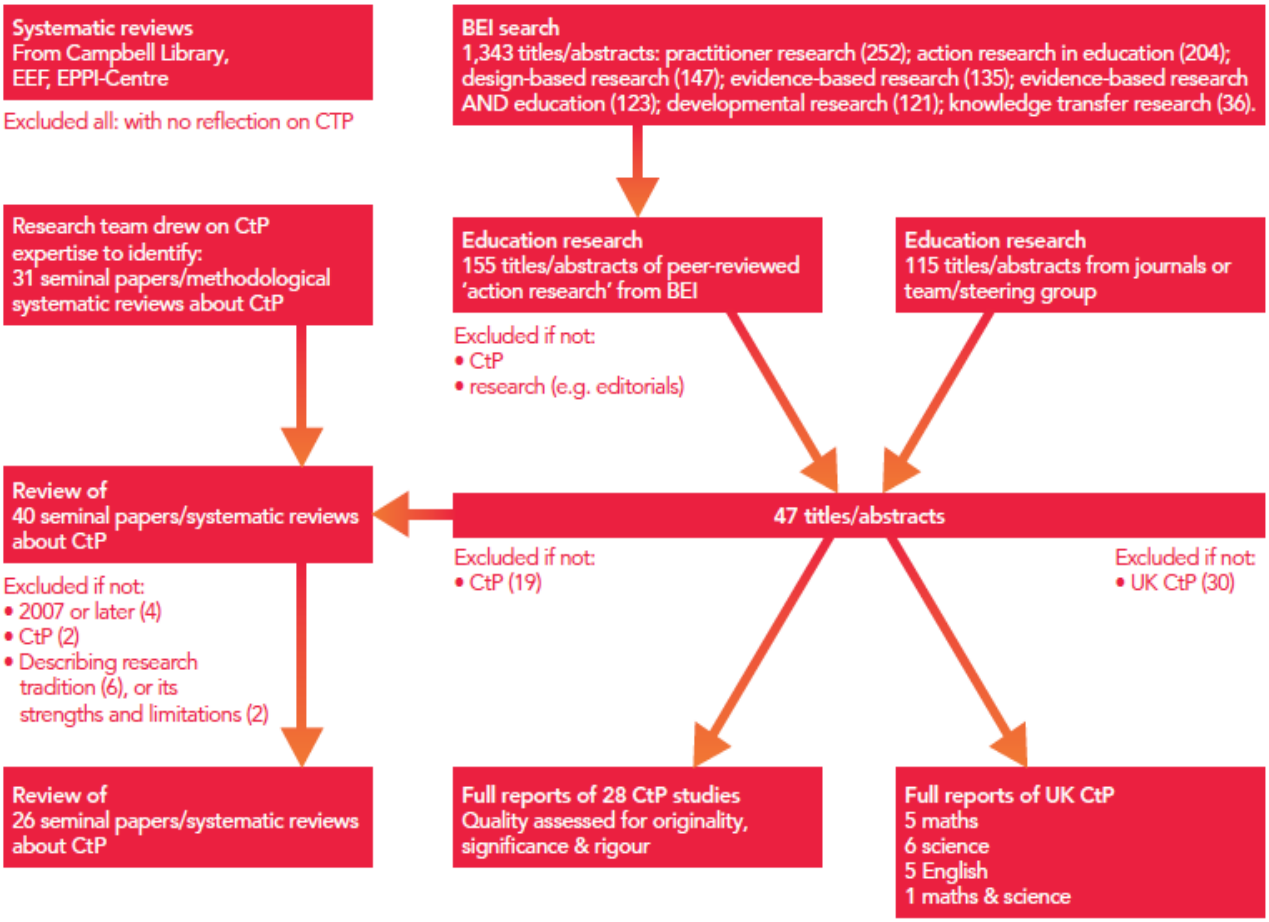


Figure 2:


Systematic reviews
From Campbell Library, EEF, EPPI-Centre
Excluded all: with no reflection on CTP
BEI search
1,343 titles/abstracts: practitioner research (252); action research in education (204); design-based research (147); evidence-based research (135); evidence-based research AND education (123); developmental research (121); knowledge transfer research (36).
Research team drew on CtP expertise to identify:
31 seminal papers/methodological systematic reviews about CtP
Education research
155 titles/abstracts of peer-reviewed 'action research' from BEI
Excluded if not:
• CtP
• research (e.g. editorials)
Education research
115 titles/abstracts from journals or team/steering group
Review of
40 seminal papers/systematic reviews about CtP
47 titles/abstracts
Excluded if not:
• CtP (19)
Excluded if not:
• UK CtP (30)
Excluded if not:
• 2007 or later (4)
• CtP (2)
• Describing research tradition (6), or its strengths and limitations (2)
Review of
26 seminal papers/systematic reviews about CtP
Full reports of 28 CtP studies
Quality assessed for originality, significance & rigour
Full reports of UK CtP
5 maths
6 science
5 English
1 maths & science